

REMARKS

Claims 1, 15, 19, and 36 have been amended, and new claim 37 has been added.

Claims 1, 15, 19, and 36 were amended to recite reduced generation of air voids. Specifically, claim 1 now recites “and whereby generation of air voids is reduced between the photosensitive layer (B) and a substrate after the photosensitive film is laminated on the substrate after removal of the protecting film (C) from the photosensitive film”; claim 15 now recites “wherein generation of air voids is reduced between the photosensitive resin layer (B) and the substrate”; claim 19 now recites “and whereby generation of air voids is reduced between the photosensitive resin layer and a substrate after the photosensitive film is laminated on the substrate after removal of the protecting film from the photosensitive film”; and claim 36 now recites “after laminating the photosensitive film on a substrate after removal of the protecting film (C) from the photosensitive film.” These additions are supported in the specification on page 4, lines 22-27. Moreover, claim 36 was amended to remove reference to the number of air voids/m².

New claim 37 depends on claim 1 and recites that “substantially no fish eyes are disposed in the protective film” as supported in the specification on page 19, Table 2.

This amendment adds no new matter.

The Rejections

Claims 1-5, 7-10, 13, 14, 18, 19, 21-25, 28, 29 and 31 stand rejected under 35 U.S.C. 103(a) as unpatentable over Hilger (U.S. Patent 4,698,292) in view of Fifield (DE 3,825,782A, translation). Claims 1-10, 13-19, 21-25 and 28-36 stand rejected under 35

U.S.C. 103(a) as unpatentable over Taguchi (U.S. Patent 4,360,582) in view of Fifield.

Claims 12 and 27 stand rejected under 35 U.S.C. 103(a) as unpatentable over Taguchi in view of Fifield, and further in view of Hoffman (U.S. Patent 4,710,446). Claims 11 and 26 stand rejected under 35 U.S.C. 103(a) as unpatentable over Taguchi in view of Fifield, and further in view of Hatanaka (U.S. Patent 6,133,343).

Applicants respectfully traverse the rejection and request reconsideration for the following reasons.

The Invention

The present invention provides a photosensitive film usable in metal etching fabrication of lead frames, metal masks, and the like, with reduced generation of air voids which cause formation of defective patterns and breakage of wire. The present inventors have found for the first time that such air voids are caused by very fine fish eyes, difficult to find by the naked eye, in the protecting film in the photosensitive film.

Furthermore, formation of the air voids relates to film thickness of the photosensitive layer, so that a thinner photosensitive resin layer results in more air voids. This finding is important to the present invention.

Applicants' Arguments

Examiner's Mischaracterization of the Application

As a first preliminary matter, Applicants respectfully point out that the Examiner's assertion that "the claimed invention does not require a specific material to be used" (Office

Action dated June 17, 2003, page 7, line 15) is incorrect. Namely, claims 2, 4, 8, 10, 11, 12, 23, 25, 26, and 27 all recite limitations directed to specific materials. For example, claim 4 is directed to a polypropylene film. Moreover, the Declaration filed on December 11, 2002 demonstrated unexpected results relating to composition of the protective film. Therefore Applicants request reconsideration of the rejections in light of the above-mentioned claim limitations, and in light of the unexpected results described in the Declaration.

As a second preliminary matter, the Examiner asserts that the limitation “protecting film (C) does not exceed 5 fish eyes/m²” in claims 1, 19, and 36 is a process limitation, and therefore declines to give it patentable weight (Office Action dated June 17, 2003, page 2, paragraph 2). A process limitation is directed to the way in which a product is made. MPEP 2173.05(p). The quoted limitation refers not to the way in which film (C) is made, but rather to a property of the film, and is therefore not a process limitation. Moreover, even process limitations, to the extent they distinguish claims from the prior art, must be given the same consideration as traditional product characteristics. In re Luck and Gainer 177 U.S.P.Q. 523, 525 (C.C.P.A. 1973). None of the prior art teaches the quoted limitation. In particular, the Hilger reference fails to teach a protecting layer that has the number of fish eyes having a diameter of at least 80 μm that does not exceed 5 fish eyes/m² when measured under a microscope at a multiplication of 100 as admitted by the Examiner (Office Action, dated November 27, 2001, page 3, lines 15-17; and Office Action, dated April 16, 2002, page 3, lines 16-17), which is subject matter recited in claims 1, 19 and 36. Applicants therefore respectfully request reconsideration of claims 1, 19, and 36 in light of the above.

As a third preliminary matter, the Examiner’s assertion “that when the protecting layer has fish eyes in the claimed range, the photosensitive layer would inherently have air voids in

the claimed range” (Office Action dated June 17, 2003, page 2, paragraph 3) is incorrect. Namely, it contradicts the experimental evidence detailed in the Declaration filed on December 11, 2002 indicating that the number of air voids can be reduced merely by varying the thickness of the photosensitive layer (page 3, Table 1). In light of this misunderstanding on the part of the Examiner, Applicants respectfully request reconsideration of the claim rejections.

The Claim Rejections Are Improper

Regarding the rejection of claims 1-5, 7-10, 13, 14, 18, 19, 21-25, 28, 29, 31 and 36 under 35 U.S.C. 103(a) over Hilger (U.S. Patent 4,698,292) in view of Fifield (DE 3,825,782A, translation), the Examiner states that Hilger teaches all of the limitations of the claims except for details regarding the protective or covering film. The Hilger reference discloses a photopolymerizable recording material that includes a transparent support film, a thermoplastic photopolymerizable photoresist layer, and a flexible covering film on the exposed surface of the photoresist layer (see Abstract). Nowhere does Hilger teach, or even suggest, reduced numbers of air voids as disclosed in claims 1, 15, 19, and 36, and the examiner admits that Hilger fails to disclose features of the protective layer. The Fifield reference discloses a dry film photoresist used in manufacturing PCBs that is formed as a roll including a photopolymerisable film (P) laminated between a base film (B) and a covering film (C) (see English Abstract). Moreover, nor does Fifield teach reducing the number of air voids generated at the interface of the photosensitive resin layer and the photosensitive film. The Examiner points out that Fifield teaches advantages of the “product roll” having a “uniform appearance” and “les gels and other trapped particles” which cause “grooves in the resist” (Fifield translation, p. 11, lines 3-9). However, the language used indicates that these

defects taught by Fifield are **macroscopic** and ascertainable to the naked eye, unlike the microscopic fisheyes disclosed in the present invention. Additionally “grooves” are clearly different than “air voids” as taught in the present invention. Finally, the references do not teach that “substantially no fish eyes are disposed in the protective film” as disclosed in claim 37.

The Examiner argues that it would have been obvious to one of ordinary skill in the art to make as few inclusions as possible and that this determination of optimal results can be achieved by routine experimentation. We point out the Examiner’s statement regarding the desirability to have as few inclusions as possible does not mean that one of ordinary skill in the art could determine optimal results by routine experimentation. This is a conclusory statement that lacks substance. It is not based on any evidence in the record and is therefore untenable. In re Zurko 258 F.2d 1369, 1386 (Fed. Cir. 2001). The Applicants respectfully request that either concrete evidence be supplied supporting the assertion, or that the rejection be withdrawn. To the extent that the Examiner is taking official notice of these allegations, the notice is traversed.

For all of the above reasons, the Applicants respectfully traverse the rejection of claims 1-5, 7-10, 13, 14, 18, 19, 21-25, 28, 29, 31, and 36.

Regarding the rejection of claims 1-10, 13-19, 21-25, and 28-36, Taguchi fails to teach or even suggest reducing the number of air voids as disclosed in the independent claims, or that “substantially no fish eyes are disposed in the protective film” as disclosed in claim 37. Because the other references also lack certain claim elements as discussed above, the Applicants respectfully traverse the rejection of claims 1-10, 13-19, 21-25, and 28-36.

Neither of the two remaining references make up the deficiencies of the Hilger reference, the Fifield reference, and the Taguchi reference. Therefore, Applicants respectfully traverse the rejections of claims 12 and 27, and 11 and 26.

Moreover, although the Examiner discounts them, Applicants reaffirm their arguments in Amendment (E) (filed October 16, 2002) regarding the lack of motivation to combine the references and the lack of expectation of success in such combination.

Conclusion

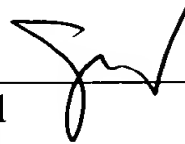
For all of the above reasons, claims 1-19 and 21-37 are neither anticipated by, nor obvious in view of, the prior art of record. The Examiner's combination of the Hilger reference, or the Taguchi reference, with the Fifield reference (1) lacks proper motivation, (2) lacks a reasonable expectation of success, and (3) fails to teach the subject matter of the independent claims. Moreover, the expected results described in the Declaration filed on December 11, 2002 overcome any prima facie claim of obviousness. Consequently, the Examiner's rejection is untenable and should be withdrawn, and the Applicants respectfully

request that the application be reconsidered. Applicants believe that the present claims are in condition for allowance, and prompt notice of allowance is respectfully requested. Questions are welcomed by the below-signed attorney for applicants.

Respectfully submitted,

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